

AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of the Claims

1. (Currently Amended) An extracellular method of regulating quorum sensing in bacteria expressing *Vibrio fischeri* LuxR or a homologue thereof, said method comprising modulating the activation by a signaling molecule of *Vibrio fischeri* LuxR or a homologue thereof by administering to said bacteria an antibody which specifically binds *Vibrio fischeri* LuxR or the homologue thereof, wherein the binding of an antibody to *Vibrio fischeri* LuxR or the homologue of *Vibrio fischeri* LuxR prevents said *Vibrio fischeri* LuxR or homologue of *Vibrio fischeri* LuxR from being activated by its signalling molecule.
2. (Canceled)
3. (Previously presented) The method according to claim 1 wherein said bacteria are Gram negative.
4. (Currently Amended) The method according to claim 1 or claim 3 wherein said homologue of *Vibrio fischeri* LuxR is selected from the list consisting of AhlR, AhyR, AsaR, BafR, BisR, BpsR, BviR, CarR, CepR, CerR, CinR, CsaR, CviR, EagR, EcbR, EchR, EsaR, ExpR, HalR, LasR, Mll8752, MupR, PcoR, PhzR, PmlR, PpuR, PsmR, PsyR, RaiR, RhiR, RhlR, SdiA, SdiR, SmaR, SolR, SpnR, SprR, SwrR, TraR, TriR, TrlR, TrnR, VanR, VsmR, Y4qH, YenR, YpeR, YpsR, YruR, YtbR and YukR.
5. (Previously presented) The method according to claim 1 or claim 3 wherein the signaling molecule is a N-acylated homoserine lactone.
- 6-7. (Canceled)

8. (Previously presented) The method according to claim 1 wherein said antibody is a monoclonal antibody.
9. (Withdrawn) An antibody that immunoreacts with LuxR or a homologue of LuxR in the region between amino acid residues 19 and 80 of SEQ ID NO: 5.
10. (Withdrawn) The antibody according to claim 9 wherein said antibody immunoreacts with LuxR or a homologue of LuxR in the region between amino acid residues 19 and 31 of SEQ ID NO: 5.
11. (Withdrawn) An antibody which immunoreacts with the sequence of SEQ ID NO: 1.
12. (Withdrawn) The anti-idiotypic antibody that binds to an antibody according to any one of claims 9 to 11 or claim 40. (1)
13. (Withdrawn) The antibody according to any of claims 9 to 11 or claim 40 conjugated to a detectable label.
14. (Withdrawn) The antibody according to claim 13 wherein said label is a radioisotope, a fluorescent molecule, a heavy metal molecule or an enzyme.
15. (Withdrawn) A pharmaceutical composition comprising an antibody according to any one of claims 9 to 11 or claim 40.
16. (Withdrawn) A vaccine composition comprising LuxR, a homologue of LuxR, a fragment of LuxR, a fragment of a homologue of LuxR, a nucleic acid encoding one of these molecules or a quorum sensing signaling molecule.
17. (Withdrawn) The vaccine composition according to claim 16 wherein said quorum sensing signaling molecule is a N-acylated homoserine lactone.

18. (Withdrawn) The vaccine composition according to claim 16 or claim 17 further comprising a pharmaceutically acceptable diluent or carrier.
19. (Withdrawn) The vaccine composition according to claim 16 or claim 17 further comprising an adjuvant.
20. (Withdrawn) A LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, the antibody according to any one of claims 9 to 11 or claim 40, the pharmaceutical composition according to claim 15, or the vaccine composition according to claim 16 or claim 17 for use as a medicament.
21. (Withdrawn) A method of treating a subject having a disease in which quorum sensing is implicated, comprising administering to said subject LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, the antibody according to any one of claims 9 to 11 or claim 40, the pharmaceutical composition according to claim 15, or the vaccine composition according to claim 16 or claim 17.
22. (Withdrawn) A method of sensitizing an antibiotic resistant bacterium to an antibiotic, comprising administering to said bacterium LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, a ligand, the antibody according to any one of claims 9 to 11 or claim 40, the pharmaceutical composition according to claim 15, or the vaccine composition according to claim 16 or claim 17.
23. (Withdrawn) A method of manufacture of a medicament for sensitising an antibiotic resistant bacterium to an antibiotic, comprising administering to said bacterium LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, a ligand, the antibody according to any one of claims 9 to 11 or claim 40, the pharmaceutical composition according to claim 15, or the vaccine composition according to claim 16 or claim 17.

24. (Withdrawn) A method of treating a subject having a disease in which quorum sensing is implicated wherein the patient suffering from that disease is refractive to antibiotic therapy, comprising administering to said subject LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, a ligand, the antibody according to any one of claims 9 to 11 or claim 40, the pharmaceutical composition according to claim 15, or the vaccine composition according to claim 16 or claim 17.
25. (Withdrawn) A method of treating a subject having a disease in which quorum sensing is implicated, comprising administering to said subject in conjunction with an antibiotic LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, a ligand, the antibody according to any one of claims 9 to 11 or claim 40, the pharmaceutical composition according to claim 15, or the vaccine composition according to claim 16 or claim 17.
26. (Withdrawn) A method of treating a subject having a disease in which quorum sensing is implicated, comprising administering to said subject an antibiotic, wherein the subject being treated is pre-administered with a pharmaceutical composition or vaccine according to the invention.
27. (Withdrawn) The method of claim 21 wherein disease is caused by *Vibrio salmonicida*, *Aeromonas hydrophila*, *Burkholderia ambifaria*, *Burkholderia pseudomallei*, *Burkholderia mallei*, *Burkholderia stabilis*, *Burkholderia vietnamiensis*, *Burkholderia multivorans*, *Escherichia coli*, *Serratia marcescens*, *Salmonella typhi*, *Brucella suis*, *Brucella melitensis*, *Yersinia ruckeri*, *Hafnia alvei*, *Shigella flexneri*, *Serratia liquefaciens*, *Enterococcus faecalis*, *Pseudomonas aeruginosa*, *Burkholderia cepacia*, *Pseudomonas fluorescens*, *Providencia stuartii*, *Klebsiella aerogenes*, *Yersinia pestis*, *Yersinia enterocolitica* or *Yersinia pseudotuberculosis*.

28. (Withdrawn) The method according to claim 21 wherein said disease is Crohn's disease or Cystic Fibrosis, cellulites and ecthyma, Glanders, melioidosis, meningitis, septicaemia, pneumonia, enteric infections and urinary tract infections, food poisoning, chest infections, typhoid fever, Malta disease, blood stream infections, shigellosis, salmonellosis, black death and gastroenteritis, hitra disease in Atlantic salmon, haemorrhagic septicaemia in marine fish, spontaneous abortion in pigs and sheep, red mouth disease in rainbow trout, and cranial and eye lesions in fish.
29. (Withdrawn) The method according to claim 22 wherein said antibiotic is erythromycin A, rifampin, tetracycline, chloramphenicol, norfloxacin, nalidixic acid or penicillin G.
30. (Previously Presented) The method according to claim 1 or claim 3, wherein the binding of an antibody inhibits biofilms.
31. (Withdrawn) A method of detection of quorum sensing bacteria comprising;
  - (i) probing a sample of bacteria with a labelled antibody according to claim 13, and
  - (ii) detecting the presence of antibody attached to bacteria.
32. (Withdrawn) A method of detection of quorum sensing bacteria comprising;
  - (i) probing a sample of bacteria with a first antibody according to claim 1,
  - (ii) probing said first antibody with a second, labelled antibody, and
  - (iii) detecting the presence of the second antibody attached to bacteria.
33. (Withdrawn) A method of detecting antibodies specific for LuxR or a homologue thereof comprising:
  - (i) probing a sample of serum with whole bacterial cells expressing whole or a fragment of LuxR or a homologue thereof,
  - (ii) probing the bacteria/antibody complex with a second, labelled antibody, and
  - (iii) detecting the presence of the second antibody attached to the bacteria/first antibody complex.

34. (Withdrawn) A method of detecting antibodies specific for LuxR or a homologue thereof comprising:
  - (i) probing a sample of serum with purified LuxR or a fragment or homologue thereof,
  - (ii) probing the bacterial protein/antibody complex with a second, labelled antibody, and
  - (iii) detecting the presence of the second antibody attached to the bacteria/first antibody complex.
35. (Withdrawn) A kit comprising an antibody according to claim 9.
36. (Withdrawn) A kit comprising a fragment of LuxR or a fragment of a homologue of LuxR for the detection of antibodies thereto.
37. (Withdrawn) A method of inhibiting quorum sensing comprising sequestering quorum sensing signal molecules.
38. (Withdrawn) An anti-idiotypic antibody that binds to an antibody according to any one of claims 9 to 11 or claim 40 in a method of inhibiting quorum sensing comprising sequestering quorum sensing signal molecules.
39. (Withdrawn) A kit comprising for simultaneous, separate or sequential use (i) LuxR, a homologue of LuxR, a fragment of LuxR or a homologue of LuxR, a nucleic acid encoding one of these polypeptides, an antibody, a pharmaceutical composition or a vaccine composition according to the invention and (ii) an antibiotic.
40. (Withdrawn) An antibody which immunoreacts with LuxR or a homologue of LuxR between the negative regulation domain and the autoinducer-binding domain.
41. (Previously Presented) The method of claim 1, wherein said antibody is unable to cross the bacterial cell membrane.